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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Alan Hodes
Beyer Weaver & Thomas, LLP
590 W. El Camino Real
Mountain View, CA 94040

EXAMINER	
PROCTOR, JASON SCOTT	
ART UNIT	**PAPER NUMBER**
2123	

DATE MAILED: 04/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/027,835	ANDERSON ET AL.	
	Examiner	Art Unit	
	Jason Proctor	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-74 is/are pending in the application.

4a) Of the above claim(s) 1-38 is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 39-74 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 20 December 2001 is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 4/10/02.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-38 have been canceled and new claims 39-74 have been added by preliminary amendment dated December 20, 2001. Claims 39-74 have been rejected.

Request for Status

Regarding Applicants' request for status filed on March 7, 2005, this office action is considered a sufficient reply. No further action is deemed necessary.

Priority

1. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Australia on April 20, 2000. It is noted, however, that applicant has not filed a certified copy of the PQ 7106 application as required by 35 U.S.C. 119(b).

Drawings

2. The drawings are objected to because the numbering of views does not comply with 37 CFR 1.84(u). Drawing sheets 9 and 10 should be labeled Fig. 10 and Fig. 11, respectively, rather than Table 1 and Table 2. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be

labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 101

35 U.S.C. § 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claims 39-74 are rejected under 35 U.S.C. § 101 because the claimed invention is directed to non-statutory subject matter. MPEP 2106(II)(A) reads as follows:

> The claimed invention as a whole must accomplish a practical application. That is, it must produce a "useful, concrete and tangible result." State Street, 149 F.3d at 1373, 47 USPQ2d at 1601-02. The purpose of this requirement is to limit patent protection to inventions that possess a certain level of "real world" value, as opposed to subject matter that represents nothing more than an idea or concept, or is simply a starting point for future investigation or research (Brenner v. Manson, 383 U.S. 519, 528-36, 148 USPQ 689, 693-96); In re Ziegler, 992, F.2d 1197, 1200-03, 26 USPQ2d 1600, 1603-06 (Fed. Cir. 1993)). Accordingly, a complete disclosure should contain some indication of the practical application for the claimed invention, i.e., why the applicant believes the claimed invention is useful.

The method of independent claim 39 produces no result. The steps of the method include "processing a generic model" and "processing user-provided algorithmic expressions" but produce no result. The method of claim 39 is therefore purely algorithmic, and though executed by a computer, rejected as being directed toward nonstatutory subject matter.

4. The apparatus of claim 57 is not limited to the technological arts. The components of the "simulation apparatus" are defined as "means for processing a generic model" and "means for processing user-provided algorithmic expressions". The claim neither specifies the definitions of a "generic model" nor limits "means for processing" to the use of technology. The claim is therefore not limited to the technological arts and is taught, among numerous examples, by a human being.

Claims not specifically mentioned stand rejected by virtue of their dependence.

To expedite a complete examination of the instant application the claims rejected under 35 U.S.C. § 101 (nonstatutory) above are further rejected as set forth below in anticipation of applicant amending these claims to place them within the four statutory categories of invention.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1-38 are rejected under 35 U.S.C. § 112, first paragraph, because the specification, while being enabling for simulation of surface-to-air and air-to-air missile performance, does not reasonably provide enablement for any generic simulation. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims. While the disclosure teaches an embodiment of the invention for the simulation of missile performance and the particular details of implementation for that application, it does not teach the necessary details of implementation for any and all possible applications. For example, the disclosure does not enable a person of ordinary skill in the art to make and use a predator-prey simulation using the method of Applicants' invention.

The following is a quotation of the second paragraph of 35 U.S.C. § 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 55, 56, 73 and 74 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Claims 55 and 73 recite the limitation "the C++ class member object" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 39-41, 45, 47, 52-54, 57-59, 63, 65, and 70-72 are rejected under 35 U.S.C. § 102(e) as being anticipated by US Patent No. 6,563,503 to Comair et al. (Comair).

8. Regarding claims 39 and 57, Comair teaches a method of modeling objects for use in computer simulation wherein entities have various parameters and communicate via a communication pathway (Fig. 2; column 4, lines 22-63). The simulation is object oriented, where the entities belong to a class hierarchy (column 5, line 26 – column 6, line 4). The model is designed so that specialized entities may perform specialized functions (column 5, lines 10-24). Comair teaches a development environment for the simulations including an editor (Fig. 17, reference 620) that constructs and edits entities as well as allows for source code modification (column 14, lines 34-36).

Claim 57 recites an apparatus with means for performing the method of claim 1. Comair teaches a computer-implemented method (column 4, lines 14-19). Therefore, claim 57 is rejected for the same reasons given above for claim 39.

9. Regarding claims 40 and 58, Comair teaches that the simulation is processed in view of scalar values and tabular numeric values (Figs. 7-8B, references relating to state transition tables based on numeric parameters of CCat and CMouse entities; column 10, lines 17-36; column 11, lines 4-8).

10. Regarding claims 41 and 59, Comair teaches that the simulation includes a development environment including an editor (Fig. 17, reference 620) that constructs and edits entities as well as allows for source code modification (column 14, lines 34-36).

11. Regarding claims 45 and 63, Comair teaches that the methods of the entities are processed at regular intervals (Fig. 6; column 9, line 65 – column 10, line 16).

12. Regarding claims 47 and 65, Comair teaches that the intervals are intervals of time (column 9, line 65 – column 10, line 16; column 10, lines 37-47).

13. Regarding claims 52 and 70, Comair teaches that the editor (Fig. 17, reference 620) is used for source code creation. It is inherent that Comair's method involves parsing a source code data file to ascertain the user-provided algorithmic expressions contained within.

14. Regarding claims 53 and 71, Comair teaches that the predetermined algorithmic expressions are equations of motion of the system based on a predetermined number of degrees of freedom (column 8, line 23 – column 9, line 64). Especially relevant are Comair's treatments of velocity, acceleration, destination (column 8, line 65) and collision detection (throughout columns cited).

15. Regarding claims 54 and 72, Comair teaches executing a class object that includes a description of the generic model (Fig. 9; column 11, lines 9-50). Although Comair does not specifically mention the use of C++, the examples shown (ex. column 11, lines 39-50) are pseudo-code in the style of C++ and would be recognized by a person of ordinary skill in the art as teaching the use C++ to implement the invention.

Claim 57 is rejected under 35 U.S.C. § 102(e) as being anticipated by US Patent No. 6,078,739 to Paterson et al. (Paterson).

16. Regarding claim 57, Paterson teaches a simulation apparatus (Fig. 25) including means for processing a generic model (Fig. 25, references 502 and 520) and means for processing user-provided algorithmic expressions (Fig. 25, references 510, 502, and 520). Additional support for these means for processing can be found in Figs. 23-24 and throughout the document.

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

18. Claims 42-44, 46, 48-51, 55-56, 60-62, 64, 66-69, and 73-74 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Comair as applied to claims 41, 45, 54, 59, 63, and 72 above, and in view of "The C++ Programming Language" by Bjarne Stroustrup (Stroustrup) and further in view of "Handbook of Simulation", edited by Jerry Banks (Banks).

The teachings of Comair have been discussed above.

Stroustrup teaches the concept of *templates* in the C++ programming language. "Templates provide direct support for generic programming" (page 327). A concept supported by templates is *specialization*, which is exemplified by the following (page 341):

> I might want to say, "if the template argument is a pointer, use this implementation; if it is not, use that implementation" or "give an error unless the template argument is a pointer derived from class *My_base*." Many such design concerns can be addressed by providing alternative definitions of the template and having the compiles choose between them based on the template arguments provided where they are used. Such alternative definitions of a template are called *user-defined specializations*, or simply, *user specializations*.

Stroustrup further teaches the concept of *template function specialization* (page 344) including an example of a specialized *sort* function. Stroustrup comments on this example of template function specialization as follows:

> This does not improve the algorithm itself, but it allows improvements to its implementation. As written, *sort( )* will not sort a *Vector<char*>* correctly because < will compare the two *char*s*. That is, it will compare the addresses of the first *char* in each string. Instead, we would like it to compare the characters pointed to.

As would be understood by a person of ordinary skill in the art, Stroustrup is directly teaching the ability for a user to provide a specialized function that replaces an abstracted or generic function in the base template.

Banks teaches numerous principles of modeling and simulation. Most pertinent to the claimed invention are Banks' treatment of a *model* (Section 1.3.1, pages 6-7), modeling structures (Sections 1.4 – 1.4.4, pages 9-10), and steps in a simulation study (Section 1.7, pages 15-18).

19. The claims rejected under 35 U.S.C. § 103(a) recite numerous well known features of common computer systems, numerous well known features of the C++ programming language, and numerous well known principles of modeling and simulation. The references Stroustrup and Banks are both extremely well known in the art and it would have been obvious to a person of ordinary skill in the art at the time of Applicants' invention to use the teachings of Stroustrup, a programming language manual, and the teachings of Banks, a handbook of modeling and simulation principles, in combination with his own knowledge of the particular art and the teachings of Comair

to arrive at simulation system wherein entities are represented by generic models that can be further specialized, as in C++ templates.

20. To comment on claims 42-44 and 60-62, execution of code on a virtual machine is extremely well known in the art. The use of a data bus is taught by Comair (Fig 2., reference 102) and also extremely well known in the art. Requesting data values from a data bus is an extremely well known use for a data bus and indeed the very reason why a person of ordinary skill in the art would implement a data bus. Storing data and input in a file is extremely well known in the art, as is parsing a data file to configure or provide input to a computer program.

21. To comment on claims 46, 48-51, 64, and 66-69, different techniques of simulation are extremely well known in the art and taught by Banks. These claims recite *discrete simulation*.

22. To comment on claims 55-56 and 73-74, the features provided by object-oriented C++ are extremely well known in the art, including the concept of *data encapsulation*, whereby access to protected objects or data values is provided through public functions. Claims 56 and 74 appear to recite combinations of limitations found in other dependent claims, none of which are regarded as novel or non-obvious.

23. The combination used to reject these claims is regarded as the invention of Comair implemented in object-oriented C++, including templates as taught by Stroustrup, and adhering to the principles of modeling and simulation taught by Banks.

Conclusion

Art considered pertinent by the examiner but not applied has been cited on form PTO-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Proctor whose telephone number is (571) 272-3713. The examiner can normally be reached on 8:30 am-4:30 pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin J Teska can be reached on (571) 272-3716. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-3713.

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist: 571-272-2100. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Jason Proctor
Examiner
Art Unit 2123

KEVIN J. TESKA
SUPERVISORY
PATENT EXAMINER